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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/597,478	06/20/2000	Rakendra Kumar Bera	JP9-1999-0272US1	5293

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EXAMINER

DO, CHAT C

ART UNIT	PAPER NUMBER
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2124

DATE MAILED: 07/27/2004

14

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/597,478

Applicant(s)

BERA, RAKEMDRA KUMAR

Examiner

Chat C. Do

Art Unit

2124

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 December 2003.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-14 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 1-14 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-3, 10-13, and 14 clearly recite a computer related method for determining an equivalence of a set of simultaneous linear algebraic equations according to a mathematical algorithm. Claims 4-6 and 7-9 recite a computer apparatus and computer program product implementing the above method but fail to limit the apparatus to any particular structure other than a general computer with input, memory, and processing device. Indeed, any apparatus used to implementing the underlined method would result in an apparatus as claimed. In order for such a claimed to be statutory, the claims must include either a step that results in a physical transformation outside the computer or a limitation to a practical application. It is clear from claims 1-14 that the claims merely recite data computation and manipulation steps in performing a mathematical function. The inputs are numbers and the outputs are also numbers. The claims fail to recite any step that results in a physical transformation outside the computer or include a limitation to practical application. Accordingly, claims 1-14 are clearly directed to a non-statutory subject matter.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being obvious over Press et al. ("Numerical Recipes in FORTRAN") in view of Hayami et al. (U.S. 5,200,915).

Re claim 1, Press et al. disclose a computer implemented method of determining the solutions of a set of simultaneous linear algebraic equations, each of equations being of a form: $e_{i1}x_1 + e_{i2}x_2 + e_{i3}x_3 + \dots + e_{in}x_n = b_i$ (page 22 equation 2.0.1) wherein x_j are unknown, e_{ij} are coefficients, and b_i are quantities (page 22 lines 7-9), coefficients and quantities being known algebraic expressions method comprising the steps of: iteratively eliminating unknowns from each of sets of simultaneous linear algebraic equations until each of equations are in the form: $(l_{ii})_k x_i = (r_i)_k$ (page 33-36 particularly equations 2.2.1, 2.2.2, and 2.2.4) wherein l_{ii} (a_{44}) and r_i (b_{44}) are algebraic expressions. Press et al. do not disclose a method of comparing for each of unknowns the products $(l_{ii})_1 * (r_i)_2$ and $(l_{ii})_2 * (r_i)_1$ wherein first and second set of simultaneous linear algebraic equations are equivalent if products match for all unknowns. However, Hayami et al. disclose a function manipulation using the associate law in the equations 19 and 20. In addition, Hayami et al. disclose that the result of x' can be computed or compared by multiplying M and y' . Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to use the comparing method of Hayami et al.

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(equations 19 and 20 in col. 9) in Press et al.'s invention to determine the equivalent of a set equations by comparing each solution of one set to one of corresponding set because the combined method of Hayami et al.'s invention in Press et al.'s invention would enable to simplify the system process and reduce the hardware.

Re claim 2, Press et al. further disclose the initial steps of: recasting algebraic expressions (equations 2.0.1 page 22) into a form of one or more token pairs arranged sequentially in a string (page 23 line 40-43), each token pair comprising an operator followed by an operand (a_{ij}); and reducing strings in accordance with a set of predetermined simplifying rules to obtain reduced expressions; and wherein eliminating step is performed on reduced strings in accordance with a set of predetermine operations (pages 33-34 using Gaussian Elimination with Back-Substitution operation to reduce equations as seen in 2.2.1).

Re claim 3, Press et al. further disclose simplifying rules in page 35 comprising the step of: arranging token pairs into subgroups (2.3.2); arranging operand tokens in an arranged subgroup in order (2.3.2); reducing the ordered operands by consolidating one or more constants and eliminating variables of opposite effect to form reduced subgroups; and consolidating one or more multiple instance of similar subgroups to produce a reduced string (equations 2.3.4-2.3.7).

Re claim 4, it is an apparatus claim of claim 1. Thus, claim 4 is also rejected under the same rationale in the rejection of rejected claim 1.

Re claim 5, it is an apparatus claim of claim 2. Thus, claim 5 is also rejected under the same rationale in the rejection of rejected claim 2.

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Re claim 6, it is an apparatus claim of claim 3. Thus, claim 6 is also rejected under the same rationale in the rejection of rejected claim 3.

Re claim 7, it is a program claim of claim 1. Thus, claim 7 is also rejected under the same rationale in the rejection of rejected claim 1.

Re claim 8, it is a program claim of claim 2. Thus, claim 8 is also rejected under the same rationale in the rejection of rejected claim 2.

Re claim 9, it is a program claim of claim 3. Thus, claim 9 is also rejected under the same rationale in the rejection of rejected claim 3.

Re claim 10, it is a general method claim of claim 1. Thus, claim 10 is also rejected under the same rationale in the rejection of rejected claim 1.

Re claim 11, it is a general method claim of claim 2. Thus, claim 11 is also rejected under the same rationale in the rejection of rejected claim 2.

Re claims 12-13, they are general method claims of claim 2. Thus, claims 12-13 are also rejected under the same rationale in the rejection of rejected claim 2.

Re claim 14, it is a general method claim of claim 1. Thus, claim 14 is also rejected under the same rationale in the rejection of rejected claim 1.

Response to Arguments

5. Applicant's arguments filed 12/01/2004 have been fully considered but they are not persuasive.

- a. In the remark, the applicant claimed to overcome the rejection under 101 in the last Office action by amending all the independent claims to include a limitation in the preamble.

However in response to applicant's arguments, the recitation "in a simulation of a physical system...linear algebraic equations" in the first four lines has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

- b. The applicant argued in page 12 for all claims that the cited reference(s) fails to disclose or suggest the sets of SLAE's is in a form of $(l_{ii})_k x_i = (r_i)_k$ wherein l and r are algebraic expressions.

The examiner respectfully submits that not all the cited claims have this limitation, particularly claims 10 and 14. The cited reference discloses in page 33 that l_{ii} (e.g. α_{44}) and r_i (e.g. b_{44}) in pages 33-36 are algebraic expressions wherein α_{44} is expressed in equation 2.3.13 and b can be determined based on α (e.g. 2.3.6). In addition, the solution of linear algebraic equations can be applied to polynomial coefficients.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chat C. Do whose telephone number is (703) 305-5655. The examiner can normally be reached on M => F from 7:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chaki Kakali can be reached on (703) 305-9662. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

7/21/2004


ANIL KHATRI
PRIMARY EXAMINER

Chat C. Do
Examiner
Art Unit 2124